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Third Mission as Institutional Strategies: Between isomorphic forces and heterogeneous pathways

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Abstract

The recent spread of the ‘entrepreneurial university’ model has been accompanied by active government policies to support commercialisation of academic research and various forms of engagement with non-academic communities. This raises questions about whether this policy drive may constitute isomorphic forces for universities to follow certain organisational pathways, leading to a uniform ‘one-size-fits-all’ model of the university third mission activities. By looking at the case of English higher education, this paper addresses the tension between external isomorphic forces and the heterogeneous nature of knowledge exchange activities at individual universities. The paper adopts an ‘institutional logic’ perspective to explain the heterogeneous pathways that organisations take in response to external environments and their own strategic choices. It draws from qualitative documentary analysis of the third mission institutional strategies of universities, as well as data from the Higher Education Business Community Interaction Survey (HEBCI), to better understand the complex and intertwined contexts of universities’ missions, strategies and perceived external environments. Against the ‘one-size-fit-all’ isomorphic pressures, each university creates their own approaches and models of third mission by targeting different areas of activities, partners and geographical areas, and by combining different set of missions, capabilities and resources. However, there is a significant variety in the extent to which individual HEIs can actually implement these strategies by generating unique internal capabilities.

Keywords: Third Mission, university strategies and missions, institutional change

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1. Introduction

In the so called knowledge-based economy, exploiting knowledge from universities and higher education institutions (HEIs) to spur economic growth and societal wellbeing has become an increasingly important policy agenda (Dill and van Vught, 2010). A number of interrelated, and may be controversial, external and internal forces have been associated with this policy drive.

There is a growing pressure for academic curricula and research activities to respond to the needs of business and industry – the process that Slaughter and Leslie (1997) called ‘academic capitalism’. Besides the traditional missions of scientific enquiry (research) and human capital development (teaching), the so-called ‘third mission’ has become a major policy concern for universities in recent years (Laredo, 2007). As a result, universities are increasingly engaged in a broad range of ‘knowledge exchange’ (KE) activities, and expected to act as a key contributor to the economic and social wellbeing of their countries and regions (Geiger and Sá, 2008).

These heightened expectations, from both policy and management perspectives, have been associated with concerns of a ‘one-size-fits-all’ university model, namely the consideration of HEIs as organizations with homogeneous and uniform capacities to perform and contribute to social engagement. The idea of institutional isomorphism (DiMaggio and Powell, 1983) has contributed to reinforce this view from a theoretical viewpoint. Despite their heterogeneous backgrounds and institutional differences, universities seem to be under financial and policy pressures to adopt similar practices. Such isomorphic thesis contrasts with the heterogeneous pathways that HEIs appear to adopt in practice. Empirical studies indeed depict a very diverse higher education sector, and a tendency of universities to respond differently to external opportunities and challenges (Huggins et al., 2012; Hewitt-Dundas, 2012; Charles et al., 2014; Sánchez-Barrioluengo et al., forthcoming). Furthermore, voices from both academic (Geuna, 1999; Sánchez-Barrioluengo, 2014) and policy (EC 2005; 2006) spheres have put forth alternative approaches focused on specialisation of universities’ activities and missions in different national and international contexts. However, this heterogeneity has arguably not been sufficiently recognised by policy makers (Charles et al., 2014),

potentially undermining the multiple ways in which HEIs can contribute to social and economic progress.

In this light, this paper aims to contribute to a better understanding of the tension between the external homogenising process of higher education policy frameworks and the internal dynamics behind third mission activities within organisations across different types of universities. Given the different portfolios of knowledge exchange activities that different types of universities engage in (Sánchez-Barrioluengo et al., forthcoming) as the starting point, this paper asks the following research question: *How do universities select and mix different knowledge exchange activities as part of their diversifying third mission institutional strategies?* The paper aims to contribute to a better understanding of how universities build their third mission strategies based on their own strengths and internal capabilities, as a response to external policy pressures and perceived opportunities.

The next section provides a review of the literature highlighting the tension between homogenising isomorphic external forces and heterogeneous knowledge exchange activities. In the Third section, we focus on the UK higher education sector as a case study and use the quantitative dataset from Higher Education Business Community Interaction (HEBCI) Survey for the post-financial crisis period illustrating the diversity of third mission performance across different types of HEIs. Our main empirical analysis consists of a qualitative approach to the institutional strategies of HEIs in England conducting documentary analysis of a selected number of third mission institutional strategies. The final section concludes the paper by arguing that each university create their own approaches - ‘institutional logics’ - to third mission - by targeting different areas of activities, partners and geographical areas, and by combining different set of missions, capabilities and resources.

2. Institutional lens to Third Mission: Isomorphic forces, legitimacy and institutional logics

2.1 Third Mission as Isomorphic Forces

The rise of the ‘third mission’ as higher education policy can be set against the backdrop of broader transformations in the academic system. Well-known approaches

documenting the changing nature of science and the transformation of academic and research organizations include the 'Mode 2' of knowledge production (Gibbons et al., 1994; Nowotny et al., 2003) and the 'triple helix' (Etzkowitz and Leydesdorff, 2000) model of interactions between government, university and industry. The spread of these and related concepts such as 'the entrepreneurial university' (Clark, 1998) and 'the enterprise university' (Marginson and Considine, 2000) seem to have triggered a shift in perception of the role of universities and, accordingly, a 'new social contract in university-industry-government relations' (Leydesdorff and Meyer, 2010).

Using the concept of organisational fields, DiMaggio and Powell (1983) developed the idea of institutional isomorphism. This literature considers that an institution's desire to be seen as legitimate leads to convergence and isomorphic change since concerns over legitimacy force them to adopt certain management practices and procedures that are expected to be socially valuable (Scott, 1995). This perspective helps understand the recent transformation of universities at one level, as they try to respond to a set of higher education policies and funding pressures. Universities are under growing pressure to become more 'entrepreneurial', by, government policies supporting university third mission strategies (e.g. Lambert 2003; OECD 2002; Mowery and Sampat, 2005; HEFCE, 2006) and by higher education funding cuts and growing pressure on impact from publicly funded research. This pressure has resulted in the progressive institutionalisation of research commercialisation activities and other forms of governance for external engagement in knowledge exchange activities (Geuna and Muscio, 2010; Rossi and Rosli, 2014).

The concept of the 'entrepreneurial university' (Clark, 1998) describes the strategic attempts of HEIs to respond to reductions in public funding and to actively engage with industry and businesses 'with the objective of improving regional or national economic performance as well as the university's financial advantage and that of its faculty' (Etzkowitz and Leydesdorff, 2000; p.313). This university model has provided the rationale for active policy support of entrepreneurial activities such as the commercialisation of research results, the exploitation of intellectual property (IP) emanating from universities and, more recently, the active support of

university-industry collaborations by public policy (Geuna, 1999; Mowery and Sampat, 2005; Bercovitz and Feldman, 2006; OECD, 2007). In this context, universities have been pushed towards internal change to meet environmental demand through a variety of institutional governance mechanisms (Clark, 1998; Dill, 2014).

Institutional theory literature argues that performance and legitimacy play critical roles in the adoption of certain organisational structures. Organisations imitate practices used by others and, in turn, they will gain social support as legitimacy is endowed by other actors (Deephouse, 1999). Such pressure could turn universities into isomorphic institutions (DiMaggio and Powell, 1983). Competitions amongst HEIs are intensifying as they look for grants for research excellence on the one hand, and seek legitimacy as socially relevant organisations on the other (Pinheiro et al., 2012). Consequently, despite their institutional diversity and organisational differences, universities are under pressures to adopt similar practices, sometimes reinforcing ‘imitation drifts’ (Teichler, 2004).

2.2 Third Mission as Heterogeneous Pathways

Contrary to the emphasis on isomorphic forces, the ‘institutional logics’ perspective highlights that actors have the capacity to innovate and transform through combinations and adaptations between micro and macro processes (Thornton et al., 2012). Whilst both organisational and individual actors may reproduce behaviours consistent with existing institutional logics, they can interpret, translate, and transform institutional norms and prescriptions. Organisations and individuals can create new and modify old institutions when they have access to resources that support their self-interests (DiMaggio, 1988).

This perspective is deemed to be appropriate here because universities exhibit a strong heterogeneity in their entrepreneurial transformation (Jacob et al., 2003; Sánchez-Barrioluengo et al., forthcoming) despite the isomorphic policy frameworks and institutional pressures mentioned above. National higher education systems are historically contingent and universities with different organisational legacies arguably play different roles over years, reflecting institutional priorities, cultures and governance

structures, and also a different mix of discipline areas and characteristics of individual academics (Uyarra, 2010; Perkmann et al., 2011; Wigren-Kristoferson et al., 2011; Hewitt-Dundas, 2012; Abreu and Grinevich, 2013). Each university is a product of a distinct process of social, economic and intellectual development. This leads to weakening of centralised 'one-size-fits-all' model of higher education policy and university management. Universities strive to position and differentiate themselves within an increasingly competitive sector, and they have to find their own balance between teaching, research, and a wide set of third mission activities (see Molas-Gallart et al., 2002).

Empirical literature has documented the heterogeneity of HEIs. In relation to the third mission, universities have been found to differ in at least three ways, namely the mix of knowledge exchange activities carried out, the partners involved in these activities and the geographical scope of third mission interaction. In terms of the nature of activities, the literature finds that different universities engage in third mission differently. For instance, Hewitt-Dundas (2012) demonstrates how knowledge transfer by UK universities is influenced by research intensity (see also Boucher et al., 2003; Laursen et al., 2011). Similarly Chukumba and Jensen (2005) show that higher research quality in the US is associated with a greater amount of patents, licenses and licensing income. Under the same context, collaborative research partnerships tend to be more common among high research intensity universities (Agrawal and Henderson, 2002).

Third mission engagement can also differ in terms of the types of partners with which universities collaborate, for instance in relation to small and medium sized firms (SMEs), large firms or other, non-commercial or voluntary sector organisations. For instance it was been argued that large companies tend to be more attracted to do collaborative research with a university because of its research reputation in a particular area of interest, small firms may demand more routine services and consultancy, which are more likely to be sourced from their local university (Siegel et al., 2007; Hewitt-Dundas, 2012; Pinto et al., 2015). Finally, while some 'world class' universities may produce technologies that are transferable globally, for most universities effective

knowledge transfer is a more ‘local process, contingent upon the nature of industrial development in the regional economy’ (Dill, 2014; p.27).

Differences in third mission activities can be seen as the result of the combination of factors constituting institutional logics, including universities’ profiles developed over years, such as internal capabilities and cumulative experiences, as well as the university’s conscious strategic efforts to build up new capability and resources for certain targeted areas of third mission activities (Sánchez-Barrioluengo et al., forthcoming). It should be noted that universities are slow-changing organisations, and tend to reproduce their existing institutional logics. Nonetheless, universities do develop their new strategic priorities according to their existing capacities and recognised future opportunities. These strategies represent institutional logics depicting how the university intends to shape and respond to socio-economic environments through their explicit vision and corporate missions (Palomares-Montero et al., 2012).

Building on the above discussion, this paper now moves on to present an empirical case to better understand these tensions and balance between a) third mission policies as isomorphic forces and b) third mission conditioned by different institutional logics, whereby universities can shape their own third mission strategies and internal capabilities. The context of the empirical study is set in the higher education sector in England as a particular case within UK. In the following sections, we explain the policy and institutional contexts of the study including the portfolio of knowledge exchange activities carried out by different types of HEIs, followed by the analysis of their strategic choices in response to changes in the policy and wider socioeconomic environment.

3. Context of the Study

3.1 Third mission policies in the UK

The UK higher education is an interesting case to study given the recent devolution, increasing size and diversity of HEIs as well as the longstanding policy efforts to

support third mission activities (e.g. Perkmann et al., 2011; Hewitt-Dundas, 2012; Abreu and Grinevich, 2013). Within this broader UK context, England and the devolved nations of Scotland, Wales and Northern Ireland have developed distinctive institutional mechanisms to support third mission activities in a context of devolved higher education policy (Huggins and Kitagawa, 2012). In the UK, over the past few decades, the third mission of the university is increasingly seen as a critical dimension of universities' activities and has become progressively institutionalised and incentivised via a range of policies, funding streams and infrastructure investment (Hughes, 2011; Kitagawa and Lightowler, 2013).

The main funding scheme for third mission activities in England is, since 2001, the Higher Education Innovation Funding (HEIF). Following earlier more modest funding schemes such as Higher Education Reachout to Business and Communities (HEROBC), HEIF funding grew during the 2000s, and in its fifth round, it was maintained in cash terms at £150 million per year over the period 2011/12–2014/15. According to recent evaluations, HEIF has played an important role in helping HEIs build up their 'capacity and capability to engage with users to exchange knowledge and deliver economic and social benefits from the knowledge base' (Coates-Ulrichsen, 2014; p.11).

The allocation of HEIF funds is formula-based, with data sourced from the annual HEBCI Survey that monitors third mission activities in UK HEIs. The HE-BCI Survey collects systematic data provided by HEIs on a broad range of KE activities encompassing the contributions of universities to both economy and society.

In many countries, universities are affected by isomorphic forces through research evaluation and resource allocation mechanisms at work at various levels (see Hicks, 2012; Aagaard, 2015). Recent developments of the system for allocating the third mission funding in England appear to add to the 'isomorphic forces' shaping universities third mission strategies. For instance, Rossi and Rosli (2014) note that despite the extensive set of indicators on KE activities collected by the HE-BCI survey, funding allocation is calculated on the basis of a narrow set of mainly commercialisation metrics, potentially privileging certain activities and types of organizations over others. At the same time, and somehow paradoxically, the government stresses that universities should voluntarily choose appropriate functions

(see Sainsbury, 2007), and HEFCE states that HEIF aims to help each HEI to build distinctive third mission and integrate with their broader missions of teaching and research (HEFCE, 2008). As a consequence, there is a tension created by the public policy - between isomorphic forces and heterogeneous expectations of third mission.

In addition, universities are under severe external pressures on a number of other fronts. Firstly, in recent years English HEIs have faced a severe reduction of teaching funding in 2011, which has been accompanied with a substantial increase of the cap on tuition fees for home and EU undergraduate students (up to £9,000). All in all, universities need to demonstrate the value of education to students and relevance of research activities to funding bodies (Martin, 2012). Secondly, the expectations of universities in terms of their contribution to regional well-being has also shifted as a result of changes in the governance and funding of regional economic and social development, particularly the abolition in 2010 of the English Regional Development Agencies (RDAs), which had actively supported HEI's regional mission since the late 1900s (Charles and Benneworth, 2001; Kitagawa, 2004) and their replacement with the smaller and much less well-endowed Local Enterprise Partnerships (LEPs) (Bentley and Pugalis, 2013). Finally, whilst it is difficult to determine how the higher education sector has been affected by the financial crisis that hit the global economy in 2007 and the subsequent austerity measures introduced by the government, this climate has influenced university third mission activities by (directly or indirectly) constraining the availability of funding for external engagement of universities (Charles et al., 2014).

3.2 Diversity of UK Higher Education Institutions in third mission portfolio

The UK higher education system is diverse for historical reasons, and partly the result of informal stratification into 'mission groups' (Scott, 2014). Over the years, a number of different types of HEIs have been created through a number of waves of expansion of the sector. However, very broadly speaking, a clear difference exists between the so-called 'Old universities', which are typically more research focused, and 'New universities' which were granted university status after 1992 as a result of the Further and Higher Education Act. Whilst some of the differences are getting blurred in

recent years through further expansion of the sector, there has been a general assumption that the newer HEIs are more ‘locally oriented’ given their focus on vocational education and training, combined with lower levels of research activity and funding in basic research (Charles et al., 2014; Goddard et al., 2014).

Within the ‘Old universities’, the most important group is the Russell Group, a self-selecting “elite” group of universities that represents less than 15% of the sector in terms of the number of institutions (24 out of 176 HEIs) but capture around 75% of the total quality-related research (QR) funding granted by the HEFCE to universities in 2014-15¹. Within the Russell Group, there is a distinctive group of five universities (Imperial College, Universities of Cambridge, Oxford, Manchester and University College London) that receive a disproportionate share (32%) of QR funding. Within the ‘New universities’ we in turn find institutions which were originally established as polytechnics under local authority funding and control and converted to university status since 1992, as well as institutions that were granted university status after 2004, primarily former further and higher education colleges, specialist colleges and current higher education colleges.

These diverse historical institutional profiles in turn helps us to understand the different third mission profile of HEIs, as proposed by recent studies such as McCormack et al. (2014) and Sánchez-Barrioluengo et al. (forthcoming). We adopt a similar classification based on five university types in order to highlight the empirical diversity that exists within English HEIs. Within the *Old universities*, we distinguish three groups, namely: ‘Top 5’, ‘the rest of the Russell Group’ and ‘Other Old’ universities. Within the ‘New universities’, we differentiate between ‘Former Polytechnics’ and ‘Other New’ HEIs². In this light, we summarise third mission performance of the five types of HEIs in England in order to identify their internal

¹ HEFCE Annual funding allocations for 2013-14. Source: <http://www.hefce.ac.uk/whatwedo/invest/institns/annalocns/1314/>

² See Annex I for a list of universities included under the five categories. We exclude from our analysis specialized arts colleges due to their different remit and other characteristics including the size of the student population.

strengths related to the knowledge exchange activities each type of HEIs engage in and, in the qualitative analysis in Section 4, specific institutions are selected for documentary analysis based on such classification to identify the alignment between their current profile and their future expectations and goals. In order to highlight the diversity of portfolios of HEIs in third mission performance, we use as a data source the information available in HEBCI data over a four-year period between 2008/09 and 2011/12, which corresponds with the post financial crisis period and the period preceding the years included in the strategic plans analysed in Section 4. Specifically, we examine the following key dimensions of third mission: firstly, third mission *performance* (measured by income) of universities in terms of the mix of KE activities that compose specific portfolios; secondly, the type (public or private) of external *partners* involved in the activities; and, thirdly, the *geographical scope* of these activities (namely the degree of engagement in KE with actors at the sub-national level). In terms of performance, we specifically look at the following KE activities: contract research (*contracts*), consultancy (*consultancy*), facilities and equipment related services (*facilities*), continuing professional development and continuing education (*training*), intellectual property sales including licences (*IP sales*).³ Specifically, our data covers 107 English HEIs out of 176 UK institutions, across our identified five types of universities: 45.8% pre-1992 universities (4.7% “Top 5”, 14% “The rest of Russell Group” and 27.1% “Other Old”) and 54.2% post-1992 universities (29% “Former Polytechnics” and 25.2% “Other New HEIs”).

Based on a previous work⁴, we can argue the heterogeneity that exists within the English higher education system where different types of universities show diversity in their own portfolio of activities. Next table summarizes the empirical differences among

³ Although the survey includes a wide range of KE activities, the choice of the indicators is constrained by the existing HEBCI metrics in the full period taking into account partners and regional information.

⁴ This section summarises key findings from Sánchez-Barrioluengo et al. (forthcoming). It aims to provide the empirical evidence demonstrating the heterogeneity within the English higher education sector. For an exhaustive review of the differences between the five types of universities see the paper of Sánchez-Barrioluengo et al. (forthcoming).

the five types of HEIs, detailed graphs with further explanation are included in Annex II. At one side of the spectrum, 'Top 5' external income is mainly based on contracts, interacting highly with large firms (almost 58% of the total third mission income is provided by large firms) and non-commercial agents and a relatively low relationship with SMEs and regional actors. The 'Rest of Russell Group' derives also significant income from research contracts as well as consultancy activities, and interact extensively with both SMEs and large firms depending on the activity carried out. On the other side, 'Former Polytechnics' and 'Other New' HEIs derive income mainly from consultancy activities with SMEs, and their KE activities mainly take place within the boundaries of the regions. These specificities in their portfolios constitute their strengths and internal capacities to contribute to the knowledge economy. Next section will focus on particular examples within these groups in order to understand how universities select and mix different knowledge exchange activities as part of their diversifying third mission institutional strategies.

[Insert Table 1 about here]

4. Third mission as institutional strategies: Perceived opportunities, challenges and resources

4.1 Qualitative analysis of Third mission strategies

Building on the conceptual discussions developed in Section 2, this paper now turns to examine the ways in which universities may (or may not) respond to external pressures and forces by the homogenisation of their activities or, on the contrary, by reinforcing their own unique and inimitable internal capabilities and building on their current heterogeneity as evidenced in Section 3. We ask the following key question: how are universities reacting to the isomorphic policy pressures and finding their own heterogeneous pathways with their own strategies and activities? Following the illustration of the main types of universities according to their portfolio of individual capabilities, we use documentary analysis in order to identify individual HEI's

positioning of their third mission in terms of their own strengths set against existing and potential opportunities in relation to the broader national policy landscape.

For this purpose, we examine the ‘HEIF 5 institutional strategies, which were submitted by 99 HEIs to HEFCE in the summer of 2011 as a precondition for the release of the last round of HEIF funding (2011-2015).⁵ The HEIF institutional strategies 2011-2015 provide a unique systematic set of empirical evidence, which highlights how each HEIs selects and adapts their activities and how institutional strategies reflect different models of third mission implementation. HEIF 5 constitutes the most recent documents demonstrating each institution’s purposes and goals of their knowledge exchange activities. Institutional strategies as data source are subjective in nature, but illustrate the individual universities’ perceived challenges as well as opportunities in relation to their third mission and how they respond to them. Due to the data availability at the time of analysis, we only analysed the most recent round (2011-2015) of HEIF strategies. When appropriate, the analysis of HEIs’ institutional strategies submitted to HEFCE in April 2008 for the previous round of HEIF (2008-11; HEIF 4) is referenced (HEFCE, 2008) in order to identify changes and continuities in strategies.

Each institutional submission contains a description of the third mission strategy (Section A), the planned use of HEIF 2011-2015 funds (Section B) as well as other relevant information (Section C). Universities were also asked to identify how the KE strategy will correspond to broader national policies such as “Research Excellence Framework” and Research Councils’ ‘Pathways to Impact’ and government approaches to sub-national growth and student employability/enterprise education (see Annex III for the specific questions under the section covered). Specifically, ‘the strategy’ part in Section A is examined in detail here. This section provides broad institutional strategies

⁵ The strategies are extracted from “Higher Education Innovation Funding (HEIF) (2011/12 to 2014/15): policy, final allocations and request for institutional strategies”. All documents submitted from 99 HEIs in England are publicly available on the HEFCE website: <http://www.hefce.ac.uk/pubs/year/2011/201116/> [last accessed 1 May 2015]

both in general terms and more specifically related to KE activities, covering the HEIF5 period (2011-2015), including information about target sectors/beneficiaries (activities), target organisations (partners) and geographical scope of third mission.

In order to illustrate the institutional contexts of the knowledge exchange portfolios and universities' institutional strategies, we take a sample of institutions, three institutions from different English regions were selected, representing each of the five HEI types described in Section 3 (see Table 2). We examined each of the 15 institutional strategy documents by asking the following questions:

- What do individual HEIs say their third mission objectives are?
- What do they say their perceived opportunities and constraints are?
- How do they intend to match the gaps in their capabilities and resources in order to achieve their institutional objectives?

[Insert Table 2 around here]

As an overview, Table 3 summarises the key themes presented in the institutional strategies documents. Under the 'strategic targeted areas of third mission activities' identified in the documents, a variety of activities are illustrated by individual HEIs. For the purpose of analysis, key activities of each of the universities were grouped under the four categories as follows.

- "Innovation and enterprise" (including collaborative research, translational research, IP exploitation, consultancy).
- "Skills and employability"(including student placements/internships, student start-ups, student volunteering).
- "Employer engagement" (including CPD, short courses, work based learning)
- "Community and civic engagement" (including student volunteering, social enterprise).

[Insert Table 3 around here]

The institutional strategies cover much broader third mission activities than the HEBCI data sets we presented in Section 3. It is not our intention to directly link these targeted areas of strategic third mission activities with current KE income. Instead, we aim to illuminate the institutional complexities and interconnectedness of different missions and activities, and evidence some diversity across different types of HEIs. Qualitative documentary software (NVivo 10) was used in order to aid structure initial coding processes. Selected illustrations and quotes presented below from individual institutional HEIF 5 strategies reflect the differences in terms of institutional strategies and targeted areas of activities, geographical scope and partners, as well as perceived opportunities and constraints of their third mission.

4.2 Institutional strategies – Activities, partners and geography

Following the distinction between universities presented in previous section, we present first the ‘Pre-92 universities’ (including the groups of ‘Top 5’, ‘The rest of the Russell Group’ and ‘Other Old’ institutions) followed by the ‘Post-92 universities’ (including ‘Former Polytechnics’ and ‘Other New’) representing sampled institutions from each of the five types of HEIs. In the following, we include the KE activities as presented in the institutional strategies along with the targeted partner organisations. Geographical dimensions are looked into in details highlighting the effects of recent changes in external environment including shifts in local governance and consequences of recent recessions.

‘Pre-1992 Universities’: ‘Top 5’, ‘The rest of Russell Group’ and ‘Other Old’

Activities

A group of large Pre-1992 research intensive universities (‘Top5’ and the ‘The rest of the Russell Group’) shows fairly broad approaches to KE activities, covering “Innovation and enterprise”, “Skills and employability” and “Community and civic engagement”. Large Pre-1992 universities (e.g. Oxford, Manchester) tend to make

explicit connections between third mission activities and teaching and research activities.

For example, the University of Manchester ('Top 5') states in the HEIF strategy that the objectives of their KE strategy encompasses '*business engagement*', specifically increasing '*industrial income*'; building on the '*IP and incubator activities*', to increase the '*employability and enterprise ability of the graduate's*' and to develop '*social responsibility*'. The institutional strategy places the third mission as part of wider institutional activities indicating the continuum of missions. The continuum between research and third mission is stated as follows: "*translational research and IP exploitation are seen as part of research activity instead of third mission*". Student volunteering scheme was supported under a previously HEIF as third mission but in this round it "*has now been supported under teaching resources*". This shows growing links between third mission and teaching and learning through student employability and student experience agenda. External resources available for third mission activities, in particular HEIF, are used to strengthen inter-linkages and synergies between the three university missions.

On the other hand, 'Other Old' universities, which tend to be relatively smaller in size, and often have origins in technology and applied research demonstrate more targeted and focused strategies in relation to their KE activities, partners, and geographical scope. In their HEIF 5 institutional strategies, Aston University ('Other Old') identifies four key objective areas in their knowledge exchange strategy: '*collaborative research and exploitation*'; '*continuing professional development (CPD)*'; delivering high levels of '*graduate employability, entrepreneurial behaviour and enterprise*'; and '*innovative supports for SMEs and new business*'. Aston University also refers to knowledge transfer partnership (KTP) and CASE studentship numbers as evidence of their previous KE activities, indicating linkages between research, enterprise and student employability.

Partners

It is interesting to note that the dimension of actual KE income patterns differs between the three types of pre-1992 universities. While ‘Top 5’ universities, like the University of Manchester, includes as targeted partner organisations both large corporates and SMEs, ‘Other Old’ universities derive substantial income from their interaction with large firms, which seems to be recognised as a potential strength to be developed in the future, as exemplified by Aston’s case. In this case, Aston University now focuses on “*external relationship building*”, especially with large organisations, aiming to encompass broad range of KE activities with selective strategic partners. This is emphasised in its strategy:

“We will develop more strategic partnerships with large organisations, increasing their awareness of research capabilities across the University, and developing opportunities for further research projects. We will improve our management of company relationships so that these strategic partnerships will also include company involvement in teaching, placements, and other student and staff engagement, ensuring beneficial mutual understanding throughout the company and the University” (Aston University)

Geographical scope

The diverse and heterogeneous nature of the third mission activities and different collaborative relationships and partners may partly explain differences in the geographical dimension of KE activities. It should be noted that the time of the submission of the HEIF document in 2011 coincides with major changes in the sub-national governance of economic development policies in England with the abolition of the RDAs and their replacement with the newly created LEPs. All sampled HEIs (except the Imperial College in London, ‘Top5’) mention the LEPs in their strategy document.

All groups of pre-1992 universities outside of London (University of Manchester in North West, University of Oxford in Southeast - the ‘Top 5’; Newcastle University in North East, University of Sheffield in Yorkshire and Humberside, Exeter University in the South West – the rest of the ‘Russell Group’; Aston University; Cranfield University, University of Bath – ‘Other Old’) in the HEIF 5 institutional strategies documents

emphasise their third mission strategies in relation to their local and regional areas. Specifically those in the north of England refer to the ‘national economic growth agenda’ especially related to regional development, quoting the European Regional Development Fund (ERDF). In addition, the perceived external environments including both challenges and opportunities presented in the institutional strategies may affect the future geographical dimensions of third mission activities. For example, Newcastle University (‘the rest of the Russell Group’), which calls itself ‘*a civic university with a global reputation for academic excellence*’, mentions in the HEIF strategy the uncertainty related to regional policy, recession, and the effects on the relationship with local businesses:

“...the uncertainty as to when the UK will fully emerge from recession. The impact of major changes in regional policy are difficult to evaluate at the present time but the reduction in regional resources dedicated to innovation may inhibit the development of activities targeted at the local business community”(Newcastle University)

Aston University (‘Other Old’) has had strong KE activities over the past decade. For example, it was commended by HEFCE in the previous round of HEIF (HEFCE, 2008) for their successful innovation voucher programme, brokering links between SMEs and all 13 HEIs in the West Midlands region, as well as supporting social enterprises. Aston states that their strengths are in collaborative research and exploitation with relevant companies including local SMEs.

Complementary to the regional compromise, ‘Top 5’ universities also recognize to have strategies beyond the regional dimension. For example in the University of Manchester (‘Top 5’) the geographical focus of engagement mentioned in the strategy is all encompassing, covering the international, national, regional and sub-national (city-region) levels. Imperial College in London (‘Top5’) also mentions geographic diversity in their institutional strategy. Their emphasis is on the international corporate partnerships, especially aiming to increase research income from non-EU industrial sources, initially targeting North American ones.

“Given the economic environment, it is now more important for the College to develop geographic diversity within its portfolio of industrial partnerships. Between 2008-09 and 2009-10, our research income from non-EU industrial sources increased by over 18% (£9.7M to £11.5M) at a time when our funding from industry generally decreased. Building on this success, we will extend our corporate partnership support by investing in a pilot international scheme with a view to furthering our understanding of the international market”. (Imperial College)

‘Post-1992 universities’: ‘Former Polytechnics’ and ‘Other New’

Activities

Both ‘Former Polytechnics’ and ‘Other New’ universities identify “Skills and employability” and “Employer engagement” as primary areas of their KE strategies.

Within ‘Former Polytechnics’ group, there is a variety of approaches. Some universities demonstrate in their institutional strategies growing alignment between third mission and other core missions while others focus on a selected set of activities. The University of Hertfordshire represents the former case. Whilst being a new university and not research intensive, their institutional strategy recognises “*research and knowledge exchange activities are closely aligned to meet the key future demands of business and society*”, aiming to provide the graduates who can drive change in “*the public, private and voluntary sectors whether as employer or employee*”.

On the other hand, another Former Polytechnic, Middlesex University shows a focused approach in their KE strategy, with a strong emphasis on “CPD and consultancy” which are explicitly stated in its HEIF strategies document:

“... the University will grow KE income by invest[ing] in capacity for CPD and consultancy [and] by develop[ing] productive partnerships for the delivery of business services”. (Middlesex University)

Such strategies are based on the recognition that “*decline in funding in CPD for public sector organisations [will require them to] reach new private sector clienteles in the target fields*”. This is linked to a targeted sector focus:

“...create portfolios of CPD and consultancy activity by engaging with new communities of practice in performance arts, learning sectors, information sciences and technology, healthcare and health sciences, and business/management.” (Middlesex University)

‘Other New’ universities show similar focused approaches related to training, CPD and work-based learning. Amongst the sampled HEIs in this group, *Bolton University, Southampton Solent University* and *University of Derby* all show strong focus on “*work based learning*” programmes and CPD provisions targeting a variety of employment sectors. For example, *University of Derby* states:

“Our objective during this funding period is to increase the number of work based learners by developing a balanced portfolio of services and clients to ...grow as a sustainable operation and double the size of the business” (University of Derby).

Similarly, the institutional strategy presents clearly defined and focused areas of third mission activities in the case of *Southampton Solent University* (‘Other New’) with a strategic target in “*student start-ups*” under the employability agenda and inclusivity as an institution. However, linkages between activities under third mission are also recognised and such perceived linkages are reflected in organisational changes:

“Merging the separate employability and enterprise teams to create new synergies and a comprehensive ‘offer’ to students (from careers advice to start-up support) and to business and community partners (from graduate recruitment, through to Knowledge Transfer Partnership (KTP) associates and contract research).” (Southampton Solent University)

In addition, *Southampton Solent University* also remarks their aspiration to grow research excellence and broader KE activities such as contract research and consultancy, diversifying from CPD portfolio:

“... support clusters of research excellence, including emerging areas, partly to grow its consultancy and contract research engagement (a KE activity which we also intend to ‘grow out’ from our CPD portfolio)”(Southampton Solent University)

Partners & geographical scope

Partners identified in the KE interaction and the geographical dimension of the strategies are similar across the two groups. ‘Former Polytechnics’ (Middlesex University; Staffordshire University, University of Hertfordshire) and ‘Other New’ HEIs (Southampton Solent University, University of Derby, Bolton University) all demonstrate close linkages with the needs of local businesses and local authorities, explicitly stating local skills agendas and strategies. Staffordshire University (‘Former Polytechnic’) shows a strong commitment to local economic development agenda, seizing this as a new opportunity, especially at the time other support mechanisms are disappearing.

“The demise of the RDA (AWM), other sources of regeneration funding, capital grants and post CSR impacts has resulted in a greater expectation on HEI’s. The disappearance of business support schemes, intermediaries and funding, has positioned the KE agenda central to local growth”.

University of Hertfordshire (‘Former Polytechnic’) also identifies its “competitive advantage” in the exchange of knowledge where SMEs are their potential users, specifically at regional level, and develop their strategies accordingly. It has a specific focus on working with “*regional SMEs*”, which is supported by “Regional voucher schemes for SMEs” in order to help remove barriers “*leading to many new relationships and significant ongoing engagement*”. University of Hertfordshire explicitly states their engagement with the sub-national growth agenda, including community engagement and strong commitment to social enterprises.

A few universities demonstrate their efforts to diversify their geographical scope especially in response to the current business environments. *Middlesex University* (‘Former Polytechnic’) is diversifying CPD and consultancy activities into the

“overseas market” given the decline in domestic public sector market. This is in line with the University’s key objectives, namely, the university’s development of international campuses and their growing profiles as market opportunities. This can be seen as an exemplar of a strong coherence between broader institutional strategies and third mission activities, which is also pushed by the declining national market for the public sector.

4.3 Discussion

Through the analysis of HEIF institutional strategies of 15 HEIs, we observe a diversity of institutional logics - the philosophy, languages and rationale - of third mission activities, where both isomorphic forces and heterogeneous institutional logics are at work. Despite the descriptive and exploratory nature of the above empirical analysis, the HEIF institutional strategies 2011-2015 provide unique set of empirical evidence, which highlights how each HEIs selects and adapts their activities and how institutional strategies reflect different models of third mission implementation.

The cases of different universities’ institutional strategies demonstrate their deliberate choices in response to current challenges as well as perceived opportunities by selecting targeted partner organisations for specific strategic purposes, combined with explicit performance indicators and strategic geographical areas. The analysis of the HEIF institutional strategies also demonstrate the interactive relationships across three missions (teaching, research and third mission), and with wider institutional strategies. We have identified clear differences in the institutional strategies, between Pre-1992 (‘Top 5’, ‘Russell Group’ and ‘Other Old’) and Post-1992 HEIs (‘Former Polytechnic’, ‘New HEIs’) in terms of the focus of KE activities, main partners and geographical target areas. Our findings demonstrate both historical path dependency and strategic diversification of activities.

The institutional strategy document provides perceived challenges and opportunities of universities as organisational actors. One Post-1992 institution clearly relates perceived constraints in public funding as sources of third mission activities in the UK to their wider institutional strategic development such as internationalisation of

campuses and wider capacity building encompassing a range of university activities. This represents an institutional strategic choice to diversify their mission, and their KE capabilities, in response to policy pressures and broader external forces.

Post-92 Universities', both 'Former Polytechnic' and 'Other New' universities demonstrate strategic links between research and their third mission strategies, whilst many of these new HEIs also mention their growing research activities and impacts. A possible explanation for this is that new institutions are trying to imitate older institutions (for example, Russell Group universities) leading to what some authors have called 'imitation drifts' (Teichler, 2004). However, these newer HEIs are not just imitating research intensive universities. They have historically developed their unique and specialised KE portfolios, such as CPDs, consultancy and training. This may reflect their applied nature of research activities and existing external linkages. For example, University of Hertfordshire strongly focuses on SMEs and regional partners. Furthermore, their special emphasis on work-based learning, career advices, placements and start-up supports for students matches with the critical importance of employability agenda and employer engagement, connecting third mission with teaching and learning mission.

However, whether or not different HEIs are able to implement these strategies is another matter. There is arguably a huge variety in terms of the extent to which individual HEIs can actually generate 'unique and inimitable internal capabilities' (Berrone et al., 2007) in response to the external forces that promote homogenisation. Whilst old, research intensive universities are generally better-resourced to define and implement their strategies in relation to the national economic growth agenda and to find their own balance between teaching, research and third mission, newer institutions are much more constrained, having to find new ways to position themselves within their third mission strategies to specialise and differentiate in an increasingly competitive sector and with much depleted sources of funding. A longitudinal observation is needed in order to understand the processes of relationships building as organisations develop strategic approaches to build new capabilities and resources, as they identify existing challenges and create more opportunities.

5. Conclusions

The recent spread of the ‘entrepreneurial university’ model has been accompanied by active government policies to support commercialisation of academic research and various forms of engagement with non-academic communities. In England, whilst public policy initiatives may aim to encourage distinctive third mission strategies aligned with individual institutional missions, universities are subject to a number of policy pressures and external forces, which may lead to ‘one-size-fits-all’ model of third mission. Recent studies, however, point out to a clear heterogeneity in third mission activities among HEIs. It is argued that the contexts and processes of such heterogeneity have not been sufficiently recognised (Huggins et al., 2012; Hewitt-Dundas, 2012; Charles et al., 2014). In this light, this paper aimed to better understand how universities balance isomorphic forces and develop their own ‘institutional logics’ through their third mission.

Our documentary analysis of third mission strategies of English HEIs shows heterogeneous pathways of organisations against the ‘one-size-fits-all’ model. Our qualitative analysis demonstrates that whilst individual universities respond to common sets of policy requirements and expectations, each university and each type of HEIs create their own institutional logics - approaches and models of third mission by targeting different areas of activities, partners and geographical areas, and by combining different set of missions, capabilities and resources. However, there is a significant variety in terms of the extent to which individual HEIs can actually implement these strategies by generating unique and inimitable internal capabilities.

Theoretically, our findings imply limits in the traditional neo-institutional theories. The neo-institutional theory literature in general aides in explaining the influence of external pressures as isomorphic forces. However, this only provides a partial explanation. This paper adopted an ‘institutional logic’ perspective in explaining the heterogeneous pathways that organisations take in response to external environments and their own strategic choices. Building on the perspective of

institutional logics, more analysis is required in terms of the roles played by the 'embedded agency' (Garud et al., 2007) in bringing the interests, identities, values, and assumptions through the organisational changes at multiple levels. Further theoretical frameworks need to be built on, for example, by adopting a micro-foundations perspective to institutional theory (Powell and Colyvas, 2008; Cunningham et al., 2015), as well as wider literature such as resource based views (e.g. Barney, 2001) and organisational strategies (e.g. Mintzberg, 2009).

Our work has a number of limitations that merit further research. First, our analysis is limited to institutional strategies, developed for a particular policy agenda and in a pre-defined template. Second, we constrain the analysis to a sub-set of institutions which we deem illustrative of the various institutional types. Finally, we only provide a snapshot of the strategies. In the future, analysing the changes of institutional strategies over different periods of time would be a useful step forward to empirically enrich our understanding of the formation and evolution of institutional logics.

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References

- Aagaard, K. 2015. How incentives trickles down: Local use of a national bibliometric indicator. *Science and Public Policy*, 42 (5): 725-737.
- Abreu, M. and Grinevich, V. 2013. The nature of academic entrepreneurship in the UK: Widening the focus on entrepreneurial activities. *Research Policy*, 42(2): 408-422

- Agrawal, A., Henderson, R. 2002. Putting patents in context: exploring knowledge from MIT. *Management Science*, 48(1):44-60.
- Barney, J.B. 2001. Resource –based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, 27: 643-650.
- Bentley, G. and Pugalish, L. 2013. New directions in economic development: Localist policy discourses and the Localism Act. *Local Economy* 28(3): 257–274.
- Bercovitz, J. and Feldman, M. 2006. Entrepreneurial Universities and Technology Transfer: A Conceptual Framework for Understanding Knowledge-Based Economic Development. *The Journal of Technology Transfer*, 31(1): 175–188.
- Boucher, G., Conway C. and Van Der Meer E. 2003. Tiers of engagement by universities in their region's development. *Regional Studies* 37(9): 887–97.
- Berrone, P., Galabert, L., Fosfuri, A. and Gomez-Mejia, L. 2007. Can institutional forces create competitive advantage? Empirical examination of environmental innovation. Working Paper No.723, IESE Business School University of Navarra. Barcelona.
- Charles, D. and Benneworth, B. 2001. Are we realising our potential?: Joining up Science and Technology Policies in English regions. *Regional Studies* 35(1): 73-79.
- Charles, D., Kitagawa, F. and Uyarra, E. 2014. Universities in Crisis? -New Challenges and Strategies in Two English City-regions. *Cambridge Journal of Regions, Economy and Society*, 7 (2): 327-348.
- Chukumba, C. and Jensen, R. 2005. University inventions, Entrepreneurship and Startups. *NBER Working Paper* No. W 11475, Cambridge, MA.
- Clark, B.R. 1998. *Creating Entrepreneurial Universities: Organizational Paths of Transformation*. Guildford, UK. Pergamon.
- Coates-Ulrichsen, T. 2014. Knowledge Exchange Performance and the Impact of HEIF in the English Higher Education. Available at:
http://www.hefce.ac.uk/media/hefce/content/pubs/indirreports/2014/KE,performance,and,the,impact,of,HEIF/2014_keheifimpact.pdf
- Cunningham, J.A.; Mangematin, V.; O’Kane, C. and O’Reilly, P. 2015 At the frontiers of scientific advancement: the factors that influence scientists to become or choose to become publicly funded principal investigators. *Journal of Technology Transfer*, published on-line 29th March 2015.
- Deephouse, D. L. 1999. To Be Different, Or To Be The Same? It’S A Question (And Theory) Of Strategic Balance. *Strategic Management Journal*, 20: 147 – 166.
- Deem, R., Hullyard, S. and Reed, M. 2007. *Knowledge, Higher Education and the New Managerialism: The Changing Management of UK Universities*. Oxford: Oxford

- University Press.
- Dill, D. and Van Vught F. 2010. *National Innovation and the Academic Research Enterprise: Public Policy in Global Perspective*, Baltimore: Johns Hopkins University Press.
- Dill, D.D. 2014. Public Policy Design and University Reform: Insights into Academic Change in C. Musselin and P. N. Teixeira (eds.), *Reforming Higher Education: Public Policy Design and Implementation*, Dordrecht, the Netherlands: Springer. pp. 21-37.
- DiMaggio, P.J. 1988. Interest and agency in institutional theory, in *Institutional Patterns and Organizations: Culture and Environment*, ed. Lynne G. Zucker, 3–21. Cambridge, MA: Ballinger.
- DiMaggio P. J. and Powell, W. 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48: 147-160.
- Etzkowitz, H. and Leydesdorff, L. 2000. The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2): 109-123.
- European Commission. 2005. *European Universities: Enhancing Europe’s Research Base, Final report by the forum on University-based research*. Luxembourg.
- Garud, R., Hardy, C. and Maguire, S. 2007. Institutional entrepreneurship as embedded agency: An introduction to the special issue. *Organization Studies* 28, 957
- Geiger, R.L. and Sá, C.M. 2008. *Tapping the Riches of Science: Universities and the Promise of Economic Growth*. Massachusetts: Harvard University Press.
- Geuna, A. 1999. *The Economics of Knowledge Production. Funding and the structure of university research*. Cheltenham (UK). Edward Elgar.
- Gibbons, M.; Limoges, C.; Nowotny, H.; Schwartzman, S., Scott, P. and Trow, M. (1994). *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: Sage.
- Goddard, J., Coombes, M., Kempton, L. and Vallance, P. 2014. Universities as anchor institutions in cities in a turbulent funding environment: vulnerable institutions and vulnerable places in England. *Cambridge Journal of Regions, Economy and Society*, 7/2: 307–25.
- HEFCE. 2009. *Evaluation of the effectiveness and role of HEFCE/OSI third stream funding: Report to HEFCE by PACEC and the Centre for Business Research*. University of Cambridge. Available at [23/01/14]: <http://www.hefce.ac.uk/pubs/year/2009/200915/>
- HEFCE. 2008 Analysis of HEIF 4 institutional strategies. HEFCE 2008/35.
- HEFCE. 2006. Strategic plan 2006–11. Bristol: Higher Education Funding Council for England.

- Hewitt-Dundas, N. 2012. "Research intensity and knowledge transfer activity in UK universities". *Research Policy*, 41(2): 262–275.
- Hicks, D. 2012. Performance-based University Research Funding Systems. *Research Policy*, 41: 251-261.
- Howells, J., Nedeve, M. and Georghiou, L. 1998. Industry-academic Links in the UK. Final report for Higher Education Funding Council for England (HEFCE), Bristol.
- Huggins, R. and Kitagawa, F. 2012. Regional Policy and University Knowledge Transfer: Perspectives from Devolved Regions in the UK. *Regional Studies* 46: 817–832.
- Huggins, R. Johnston, A. & Stride, C. 2012. Knowledge Networks and Universities: Locational and Organisational Aspects of Knowledge Transfer Interactions. *Entrepreneurship and Regional Development*. 24(7-8): 475-502
- Hughes, A. 2011. Open innovation, the Haldane principle and the new production of knowledge: science policy and university–industry links in the UK after the financial crisis. *Prometheus*, 29(4): 411–442.
- Jacob, M., Lundqvist, M. and Hellsmark, H. 2003. Entrepreneurial transformations in the Swedish University system: the case of Chalmers University of Technology. *Research Policy*, 32(9): 1555–1568.
- Kitagawa, F. 2004. Universities and Regional Advantage: Higher Education and Innovation Policies in English regions. *European Planning Studies* 12, 6, 835-52.
- Kitagawa, F and Lightowler, C. 2013. Knowledge Exchange: A comparison of policy, incentives and funding mechanisms in English and Scottish Higher Education. *Research Evaluation* 22(1): 1-14.
- Lambert, R. 2003. Lambert review on business university collaboration. London: HMSO.
- Laredo, P. 2007. Revisiting the Third Mission of Universities: Toward a Renewed Categorization of University Activities?. *Higher Education Policy*, 20: 441-456.
- Laursen, K., Reichstein, T. and Salter, A. 2011. Exploring the Effect of Geographical Proximity and University Quality on University-Industry Collaboration in the United Kingdom. *Regional Studies*, 45 (4): 507-523.
- Leydesdorff, L. and Meyer, M. 2010. The decline of university patenting and the end of the Bayh–Dole effect, *Scientometrics*, 83: 355–362
- Marginson, S. and Considine M. 2000. *The Enterprise University: Power, Governance and Re-invention in Australia*. Cambridge: Cambridge University Press.
- Martin, B.R. 2012. Are universities and university research under threat? Towards an evolutionary model of university speciation. *Cambridge Journal of Economics*, 36(3): 543-565.

- McCormack, J.; Propper, C. and Smith, S. 2014. Herding cats? Management and university performance. *The Economic Journal* 124 (578), 534–564.
- Mintzberg, H. 2009. *Tracking strategies: Toward a general theory of strategy formation*. New York: Oxford University Press.
- Molas-Gallart, J., Salter, A., Pastel, P., Scott, A. and Duran, X. 2002. *Measuring Third Stream Activities*. Final Report to the Russell Group of Universities. Science and Technology Policy Research (SPRU), University of Sussex. Brighton (UK).
- Mowery, D. and Sampat, B.N. 2005. Universities in National Innovation Systems. In D. C. M. Jan Fagerberg, D. Mowery and R. Nelson (Eds.). *The Oxford Handbook of Innovation*. New York: Oxford University Press. pp.209-239.
- Nowotny, H.; Scott, P. and Gibbons, M. 2003. Introduction: "Mode 2" Revisted: The New Production of Knowledge. *Minerva*, 41 (3): 179-194.
- OECD. 2002. Benchmarking industry–science relationships. Paris: OECD.
- OECD. 2007. *Higher Education and Regions. Globally Competitive, Locally Engaged*. OECD, Paris.
- Palomares-Montero, D., García-Aracil, A. and Castro-Martínez, E. 2012. Misiones actuales de las universidades públicas: una perspectiva sociológica. *ARBOR Ciencia, Pensamiento y Cultura*, 188 (753): 171-192.
- Perkmann, M., King, Z. and Pavelin, S. 2011. Engaging excellence? Effects of faculty quality on university engagement with industry. *Research Policy*, 40: 539–552.
- Pinheiro, R., Benneworth, P. and Jones, G.A. 2012. *Universities and Regional Development: A critical assessment of tensions and contradictions*. Milton Park and New York: Routledge.
- Pinto, H., Fernandez-Esquinas, M. and Uyarra, E. 2015. Universities and Knowledge-Intensive Business Services (KIBS) as Sources of Knowledge for Innovative Firms in Peripheral Regions. *Regional Studies*, 49 (11): 1873-1891
- Powell, W., and Colyvas, J. 2008 Microfoundations of Institutional Theory, in Greenwood, R., Oliver, C., Suddaby, R., and Sahlin, K. (Eds.). (2008). *The SAGE handbook of organizational institutionalism*. London: SAGE pp.276-299.
- Rossi, F. and Rosli, A. 2014. Indicators of university-industry knowledge transfer performance and their implications for universities: evidence from the United Kingdom, *Studies in Higher Education*. Published online: 10 Jun 2014.
- Sainsbury, Lord. 2007. *The Race to the Top-a review of government's science and innovation policies*. London: Her Majesty's Stationary Office. [online]. Available from: http://www.rsc.org/images/sainsbury_review051007_tcm18-103116.pdf

- Sánchez-Barrioluengo, M. 2014. Articulating the ‘three missions’ in Spanish universities. *Research Policy*, 43(10): 1760–73.
- Sánchez-Barrioluengo M., Uyarra U. and Kitagawa, F. (forthcoming). Understanding the Dynamics of Triple Helix Interactions. The Case of English Higher Education Institutions
- Scott, P. 2014. The reform of English higher education: universities in global, national and regional contexts. *Cambridge Journal of Regions, Economy and Society*. 7 (2): 217-231.
- Scott, W.R., 1995. *Institutions and organizations*. Thousand Oaks, CA: SAGE.
- Siegel, D.S., Wright, M. and Lockett, A. 2007. The rise of entrepreneurial activity at universities: organizational and societal implications. *Industrial and Corporate Change* 16(4): 489–504.
- Slaughter, S. and Leslie, L. 1997. *Academic Capitalism: Politics, Policies, and the Entrepreneurial University*, Baltimore: Johns Hopkins University Press.
- Teichler, U. (2004). *Changing structures of the higher education systems: The increasing complexity of underlying forces*. In: UNESCO Forum Occasional Paper Series Paper No. 6 transfer from MIT. *Management Science* 48: 44–60.
- Thornton, P.H., Ocasio, W. and Lounsbury, M. 2012. Introduction to the Institutional Logics perspective, in Thornton, P.H., Ocasio, W., and Lounsbury, M (Eds.) *The Institutional Logics Perspective: A New Approach to Culture, Structure and Process*. Oxford: Oxford University Press. pp.2-25.
- Uyarra, E. 2010. Conceptualizing the Regional Roles of Universities, Implications and Contradictions. *European Planning Studies*, 18(8): 1227-1246.
- Wigren-Kristoferson, C., Gabrielsson, J., and Kitagawa, F. 2011. Mind the gap and bridge the gap: Research excellence and diffusion of academic knowledge in Sweden, *Science and Public Policy*, 38(6): 481-492.

Annex I. Universities included in each type

‘Top 5’	‘The Rest of Russell Group’	‘Other Old’	‘Former Polytechnics’	‘Other New HEIs’
Imperial College of Science, Technology and Medicine	King’s College London	Aston University	Anglia Ruskin University	Bath Spa University
The University of Cambridge	London School of Economics and Political Science	Birkbeck College	Birmingham City University	Bishop Grosseteste University College Lincoln
The University of Manchester	Queen Mary University of London	Brunel University	Bournemouth University	Buckinghamshire New University
The University of Oxford	The University of Birmingham	Cranfield University	Coventry University	Canterbury Christ Church University
University College London	The University of Bristol	Goldsmiths College	De Montfort University	Edge Hill University
	The University of Exeter	Institute of Education	Kingston University	Harper Adams University College
	The University of Leeds	London Business School	Liverpool John Moores University	Leeds Trinity University College
	The University of Liverpool	London School of Hygiene and Tropical Medicine	London Metropolitan University	Liverpool Hope University
	The University of Newcastle-upon-Tyne	Loughborough University	London South Bank University	Newman University College
	The University of Nottingham	Royal Holloway and Bedford New College	Middlesex University	Roehampton University
	The University of Sheffield	St George’s Hospital Medical School	Oxford Brookes University	Royal Agricultural College
	The University of Southampton	The City University	Sheffield Hallam University	Southampton Solent University
	The University of Warwick	The Institute of Cancer Research	Staffordshire University	St Mary’s University College, Twickenham
	The University of York	The Open University	Teesside University	The University of Bolton
	University of Durham	The Royal Veterinary College	The Manchester Metropolitan University	The University of Chichester
		The School of Oriental and African Studies	The Nottingham Trent University	The University of Northampton
		The University of Bath	The University of Brighton	The University of Winchester
		The University of Bradford	The University of Central Lancashire	The University of Worcester
		The University of East Anglia	The University of East London	University College Birmingham
		The University of Essex	The University of Greenwich	University College Falmouth
		The University of Hull	The University of Huddersfield	University College Plymouth St Mark and St John
		The University of Keele	The University of Lincoln	University of Bedfordshire
		The University of Kent	The University of Northumbria at Newcastle	University of Chester
		The University of Lancaster	The University of Plymouth	University of Cumbria
		The University of Leicester	The University of Portsmouth	University of Derby
		The University of Reading	The University of Sunderland	University of Gloucestershire
		The University of Salford	The University of West London	York St John University
		The University of Surrey	The University of Westminster	
		The University of Sussex	The University of Wolverhampton	
			University of Hertfordshire	
			University of the West of England, Bristol	

Annex II. Empirical evidence of heterogeneity among universities in English Higher Education Sector

This annex specifies the information used to characterize third mission performance of the five types of university identified. It includes quantitative information about knowledge exchange activities analysed as well as the empirical-based profile of the five groups of universities.

a) Third mission performance measured by knowledge exchange activities

Figure 1 presents the distribution of income derived from different KE mechanisms. It is calculated as the average share of income from each KE activities for the period 2008/09-2011/12 across the 5 types of HEIs (left axis). In addition, the right axis shows the total income from these KE activities and the average funds per group calculated as the total income divided by the number of universities in each group.

[Insert Figure 1 around here]

Figure 2 represents the variety of external partners with which HEIs are engaged in KE activities: SMEs, large firms and non-commercial organisations as identified in the HEBCI survey. The graph includes the average percentage of the total income that is coming from each type of partner for the period 2008/09-2011/12 taking into account the university type.

[Insert Figure 2 around here]

Figure 3 represents the percentage of the KE income from *partner* (with the exception of training activities because the survey does not include regional information for this variable). within the region. Information is calculated as the percentage of the total income derived from regional partners. It shows that regional KE income derives mainly from ‘soft’ activities such as consultancy and facilities, while contract research and IP sales do not seem to be limited by geographical boundaries.

[Insert Figure 3 around here]

b) *Profiles of universities according to their third mission performance*

‘Top 5’ universities: ‘Top 5’ universities derive most of their KE income (more than 70%) from contract research, followed by training activities with non-academic partners. Despite the significant amount of income generated, they are however the least engaged institutions in terms of income from regional interaction (less than 20%). In line with other studies that suggest highly skewed distribution of income from IP (Howells et al., 1998; Geuna and Nesta, 2006), IP sales constitute a relatively small share of income for all universities and mainly concentrate in this group. In relative terms, looking at the average per university, the ‘Top 5’ universities stand out from their peers, including an average income of £350 thousands per year and institution. Focusing on partner types and specifically on private partners, ‘Top 5’ HEIs engage overwhelmingly with large firms (for example 50% of income from contract research and 61% from training) and to a much lower degree with SMEs.

‘The rest of the Russell Group’: In general terms, ‘Russell Group’ universities accumulate the highest income from KE activities, £2 million in four years. This is an unsurprisingly result taking into account that this group consists of 14 leader institutions in England. Specifically, the rest of ‘Russell Group’ universities present a similar albeit to ‘Top 5’ in terms of activities slightly more diversified picture, with relatively higher engagement in consulting (21% of the total income) and other activities.

‘Other Old’ universities: In terms of activities, training is particularly important for this group and main income derived from large firms.

‘Former polytechnics’: Training activities are specifically important for ‘post-92 universities’, where training income represents more than 50% of the funds received from KE interactions. Specifically, ‘Former Polytechnics’ are the institutions with the highest presence in the regional economy (deriving on average 33% of total income from KE interaction at the sub-national level), particularly in relation to facilities (50% of income regionally), contract research and consultancy (between 30% and 40%). This result is in line with Charles et al.’s (2014) assumption that these institutions are more ‘locally oriented’.

‘Other New’ universities: ‘New universities’ exhibit a much larger engagement with SMEs across most activities, particularly consultancy activities, facilities and IP sales.

The strategy

1. Please briefly describe your institution’s overall knowledge exchange strategy, including:
 - Relationship to institutional mission (research, teaching etc).
 - Priority aims and intended outcomes.
 - Main objectives and activities.
 - Evidence base used to formulate the strategy and how it builds on past strategies.
 - Focus of your strategy in terms of target sectors/beneficiaries (e.g. low carbon/social enterprises), target organisations (e.g. SMEs) and geography (e.g. local/national/ international).
2. How will your KE strategy support/complement your institution’s approaches to other important areas of national policy (and help deliver the related national policy priorities), such as: the Research Excellence Framework and Research Council Pathways to Impact; government approaches to sub-national growth (such as Local Enterprise Partnerships); and/or student employability/enterprise education? Please illustrate the focus of your strategy with examples of relevant KE policies, projects or initiatives as appropriate to your HEI.

Table 1. Summary of patterns of KE activities across type of HEIs

	Main activity	With whom? External partner	Geographical dimension
Top 5	Contract research	Private sector Large firms	Non-regional
The rest of Russell Group	Contract research & consultancy	Private sector	Partially regional (facilities)
Other Old	Training	Private sector	Partially regional (consultancy & facilities)
Former Polytechnics	Training & consultancy	Non-commercial	Regional
Other New	Training	Non-commercial	Partially regional (training)

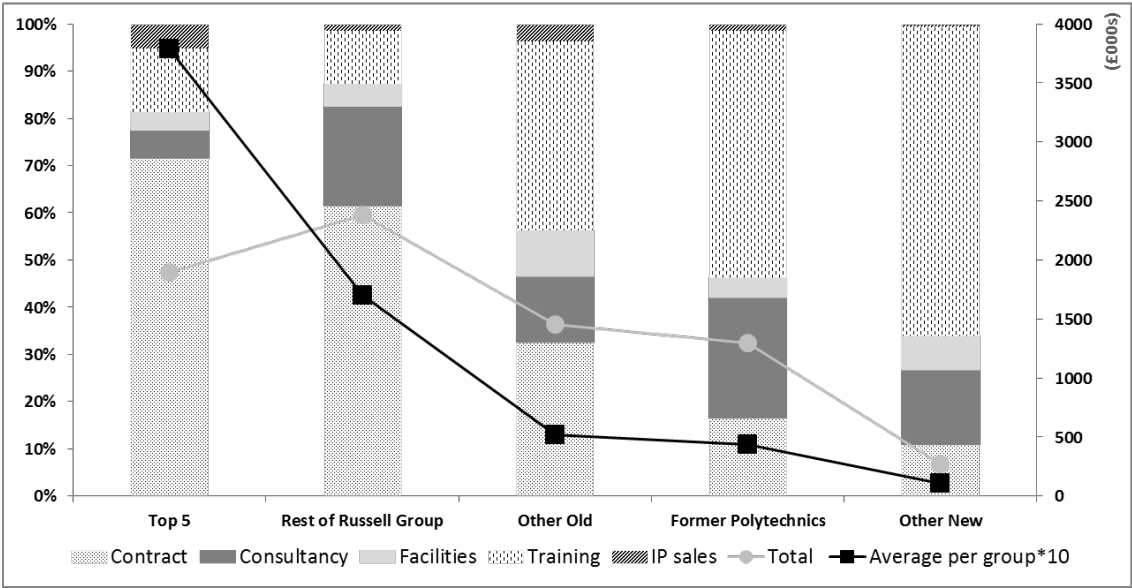
Table 2. Selected sample of HEIs for institutional strategies analysis (location)

Top 5	The rest of Russell Group	Other Old	Former Polytechnics	Other New
Imperial College (London)	Newcastle University (North East)	Aston University (West-Midlands)	Middlesex University (London)	University of Derby (East Midlands)
University of Manchester (North West)	University of Sheffield (Yorkshire &Humber)	University of Bath (South West)	University of Hertfordshire (East of England)	Southampton Solent University (South East)
University of Oxford (South East)	Exeter University (South West)	Cranfield University (East of England)	Staffordshire University (West Midlands)	Bolton University (North West)

Table 3. Key themes analysed in the individual strategy documents

Institutional Mission	KE strategies and objectives in relation to the broader Institutional Mission and links to Research and Teaching strategies
Organisational approaches	Changes in internal management structure, leadership, strategic partnership, collaboration with other HEIs
Outcomes of KE activities from previous strategies	Key indicators Initiatives, activities Connection with teaching/research
Intended outcomes of KE strategies and Key Performance Indicators	Key indicators Initiatives, activities Connection with teaching/research
Targeted sectors, partners and geography	Partners: private/public sector; SMEs/Large organisations Geography: Local; regional; national; international Sector focus
Main targeted KE activities	Innovation and enterprise Skills and employability Employer engagement Community and civic engagement
Key opportunities and challenges for KE	Areas of investment New development Consequences from the financial crisis Uncertainties due to policy changes

Figure 1. Distribution of the total income in third mission performance by type of HEI



Note: bars should be read with the left axis and represent the share of income from each KE activities. Lines should be read with the right axis and show the total income from these KE activities and the average income obtained per group.

Figure 2. Share of income in third mission by type of partner

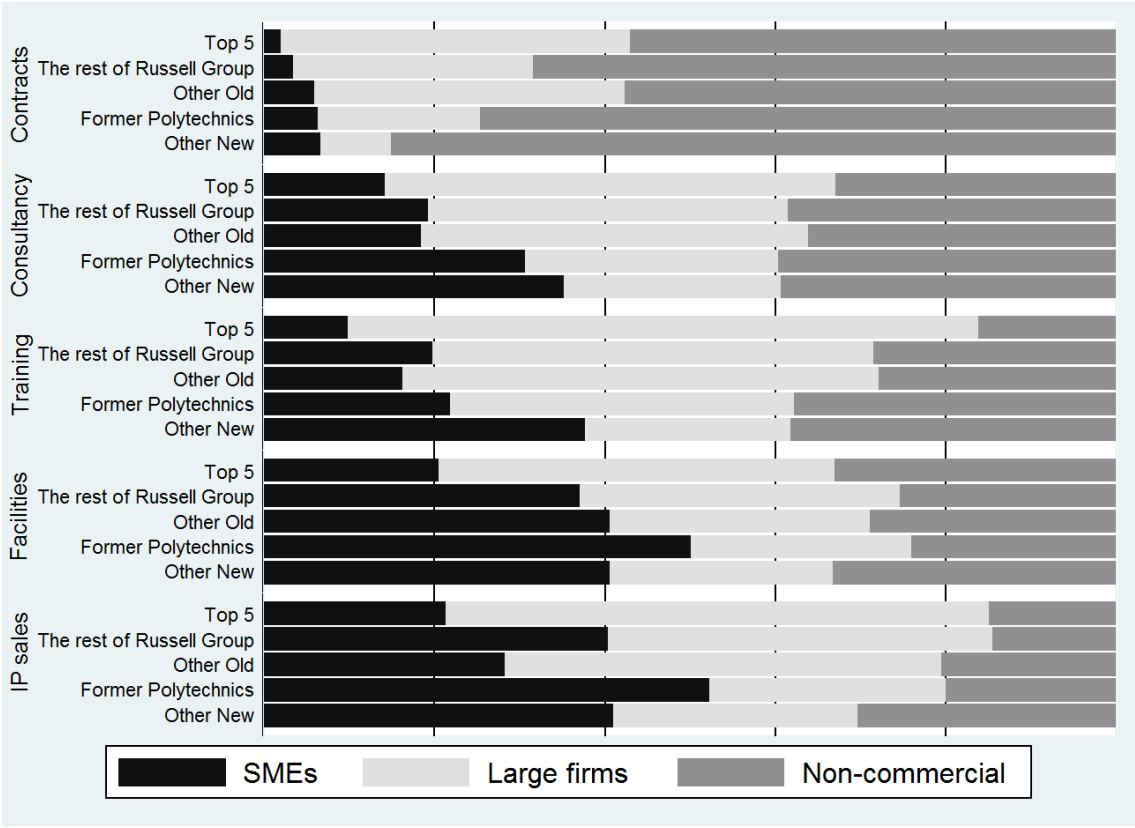


Figure 3. Regional component of third mission performance

